

MATERIALAB CONSULTANTS LIMITED

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QUARTERLY ENVIRONMENTAL MONITORING & AUDIT SUMMARY REPORT

September 2016 - November 2016

Client : SANG HING – KULY JOINT VENTURE

Contract Name : Castle Peak Road Trunk Sewer and Tuen Mun
Village Sewerage (Sewage Pumping Station at
Lok Chui Street near Castle Peak Villas)

Contract No. : DC/2014/01


EP No. : EP-068/2000/A

Title of Project : Sewage Pumping Stations at Tai Lam Chung Tsuen
Luen On San Tsuen, Tai Lam Valley and Lok Chui Street near
Castle Peak Villas under the scope of “Tuen Mun Sewerage –
Eastern Coastal Sewerage Extension”

Report No. : 0367/15/ED/0646

Prepared by : Wingo H. W. So

Reviewed by : Cyrus C. Y. Lai

Certified by : 
Colin K. L. Yung
Environmental Team Leader
MaterialLab Consultants Limited

6 December 2016



Drainage Services Department
42/F., Revenue Tower
5 Gloucester Road
Wan Chai
Hong Kong

Your reference:

Our reference: HKDSD202/50/103970

Date: 16 December 2016

Attention: Ms Winnie Ng

BY EMAIL & POST
(email: wyng03@dsd.gov.hk)

Dear Sirs

Agreement No.: PM 08/2014
Services for Independent Environmental Checker for
Construction of Lok Chui Street Sewage Pumping Station
Verification of Quarterly EM&A Summary Report (September 2016 - November 2016)

We refer to email of 6 December 2016 attaching a Quarterly EM&A Summary Report (September 2016 - November 2016) for the captioned project prepared by the ET.

We have no comment and hereby verify the Quarterly EM&A Summary Report (September 2016 - November 2016).

Please do not hesitate to contact the undersigned or our Mr Nic Lam at 2618 2836 should you have any queries.

Yours faithfully
ANEWR CONSULTING LIMITED

Adi Lee
Independent Environmental Checker

LYMA/LHHN/HCYD/csym

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1. INTRODUCTION	2
2. ENVIRONMENTAL MONITORING & AUDIT REQUIREMENTS	5
3. ADVICE ON THE SOLID AND LIQUID WASTE MANAGEMENT STATUS	6
4. ENVIRONMENTAL SITE INSPECTION AND AUDIT	7
5. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE	7
6. IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES	9
7. FUTURE KEY ISSUES	9
8. CONCLUSIONS	10

FIGURES

Figure 1	Site Layout Plan
Figure 2	Air Quality and Noise Monitoring Stations

LIST OF APPENDICES

Appendix A	Construction Programme
Appendix B	Project Organization Chart
Appendix C	Action and Limit Levels for Air Quality and Noise
Appendix D	Air Quality Monitoring Data and Graphical Presentations
Appendix E	Noise Monitoring Data and Graphical Presentations
Appendix F	Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions
Appendix G	Implementation Status of Environmental Mitigation Measures
Appendix H	Monthly Summary of Waste Flow Table

EXECUTIVE SUMMARY

- i. This is the 3rd Quarterly Environmental Monitoring Audit (EM&A) Summary Report, it presents the environmental monitoring and audit works for the period from 1 September 2016 to 30 November 2016.

Construction Activities for the Reporting Period

- ii. During this reporting period, the principal work activities within the site included:

September 2016

- Construction of Mini-pile

October 2016

- Proof drill and Loading Test

November 2016

- Construction of ELS

Breaches of Action and Limit Levels for Air Quality

- iii. No Action or Limit Level Exceedance of 1-hr TSP monitoring was recorded in the reporting period.

Breaches of Action and Limit Levels for Noise

- iv. No exceedance was recorded at all monitoring stations in the reporting period.

Complaint, Notifications of Summons and Successful Prosecutions

- v. No Action or Limit Level Exceedance of noise monitoring was recorded in the reporting period.
- vi. No complaints, notification of summons or successful prosecutions were received in the reporting period.

Reporting Change

- vii. There was no reporting change required in the reporting period.

Future Key Issues

- viii. Potential environmental impacts due to the construction activities, including air quality, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The ET will continue to implement the environmental monitoring & audit programme in accordance with the EM&A Manual and Environmental Permit requirements. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

1. INTRODUCTION

1.1 Background

- 1.1.1 Contract No. DC/2014/01 – Castle Peak Road Trunk Sewer and Tuen Mun Village Sewerage (“the Project”) includes the construction of a sewage pumping station at Lok Chui Street near Castle Peak Villas as shown in **Figure 1**.
- 1.1.2 The environmental impact assessment (EIA) report (Tuen Mun Sewerage - Eastern Coastal Sewerage Extension) – EIA Report (Register No. AEIAR-034/2000) for the Project was approved by Environmental Protection Department (EPD) dated 7 June 2000. The EIA Report involves the construction of four sewage pumping stations at Tai Lam Chung Tsuen, Luen On San Tsuen, Tai Lam Valley and Lok Chui Street near Castle Peak Villas. The scope of this EM&A Manual focuses on the Sewage Pumping Station at Lok Chui Street near Castle Peak Villas in the EIA Report. The Project is designated under Schedule 2, section F3(b) and Q1 of the Environmental Impact Assessment Ordinance (EIAO). EPD subsequently issued the Environmental Permit (EP) EP- 068/2000 on 25 July 2000.
- 1.1.3 A Register of Change to Environmental Permit was submitted to EPD to register any change to the conditions in the EP for adoption of the latest design of the Pumping Station at Lok Chui Street and justify that the latest changes would not violate the conditions as stated in the approved EIA Report and EP based on the latest engineering design information. A Variation of Environmental Permit (VEP) EP-068/2000/A was issued on 10 April 2015 and it is the current permit for the Project.
- 1.1.4 The amended EP (EP-068/2000/A) is the current permit for the Project.
- 1.1.5 In accordance to EP-068/2000/A Condition 2.3 and 2.4, an updated EM&A Manual was duly certified by ETL and verified by IEC and submitted to EPD for approval on 18 January 2016.
- 1.1.6 The construction phase and EM&A programme of the Project commenced on 29 February 2016.
- 1.1.7 This is the 3rd Quarterly Environmental Monitoring Audit (EM&A) Summary Report, it presents the environmental monitoring and audit works for the period from 1 September 2016 to 30 November 2016.

1.2 Project Organization

1.2.1 The Project Organization structure is shown in **Appendix B**. The key personnel contact names and numbers are summarized in **Table 1.1**.

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
Drainage Services Department, HKSAR (DSD)	Project Management	Ms. Winnie Ng	2594 7265	2827 8526
Engineer/Engineer's Representative (AECOM)	Resident Engineer	Ms. Jacqueline Chan	3127 5103	2441 1755
	Senior Inspector of Works	Mr. Raymond Au	3127 5160	
Independent Environmental Checker (ANEWR)	Independent Environmental Checker	Mr. Adi Lee	2618 2836	3007 8648
Contractor (SKLV)	Site Agent	Mr. Alan Lo	2674 3888	2674 6688
	Environmental Officer	Mr. Calvin Lam		
Environmental Team (MCL)	Environmental Team Leader	Mr. Colin Yung	3565 4114	3565 4160

1.3 Construction Programme and Activities

1.3.1 The construction phase of the Project under the EP commenced on 29 February 2016.

1.3.2 The construction programme of the Project is shown in **Appendix A**.

1.4 Works undertaken during the month

1.4.1 During this reporting period, the principal work activities within the site included:

September 2016

- Construction of Mini-pile

October 2016

- Proof drill and Loading Test

November 2016

- Construction of ELS

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1.5 Status of Environmental Licences, Notification and Permits

1.5.1 A summary of the relevant permits, licences and/or notifications on environmental protection for this Contract is presented in **Table 1.2**.

Table 1.2 Status of Environmental Licences, Notification and Permits

Permit / Direction / License	Ref No	Valid From	Valid Till
Environmental Permit	EP-068/2000/A	10/04/2015	N/A
Notification of Works Under APCO	391923	06/08/2015	N/A
Wastewater Discharge Licence	WT00022654-2015	23/10/2015	31/10/2020
Registration as a Chemical Waste Producer	5111-421-S3879-01	02/09/2015	N/A
Billing Account for Disposal of Construction Waste	7022922	06/08/2015	N/A

2. ENVIRONMENTAL MONITORING & AUDIT REQUIREMENTS

2.1 Monitoring Parameters and Monitoring Locations

2.1.1 In accordance with the updated EM&A Manual, monitoring of the 1 hourly average of Total Suspended Particulates (TSP) levels for air quality and the A-weighted equivalent continuous sound pressure level Leq (30min) for the time period between 0700-1900 hours on normal weekdays for noise impact. The monitoring locations are shown in **Figure 2**.

2.2 Monitoring Methodology and Calibration

2.2.1 Monitoring equipment were conducted and calibrated regularly in accordance with the updated EM&A Manual. Copies of calibration certificates are attached in the appendices of the corresponding Monthly EM&A Reports.

2.3 Environmental Quality Performance Limits (Action and Limit Levels)

2.3.1 The adopted Action and Limit Levels for air quality impact and noise monitoring are presented in **Appendix C**.

2.4 Environmental Mitigation Measures

2.4.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Reports, the EP and the EM&A Manuals. The implementation status of the mitigation measures during the reporting period is summarized in **Appendix G**.

2.5 Results and Observations

2.5.1 The weather conditions during the monitoring are presented in the Appendices of the corresponding Monthly EM&A Reports.

2.5.2 The monitoring data of 1-hr TSP are summarized in **Table 2.1**. Detailed monitoring data are presented in **Appendix D**.

Table 2.1 Summary of 1-hr TSP Monitoring Results

Reporting Months	Monitoring Station	Average ($\mu\text{g}/\text{m}^3$)	Range ($\mu\text{g}/\text{m}^3$)	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
September 2016	LC6a	68	38-123	344	500
	LC9	61	39-104	335	
October 2016	LC6a	44	29-64	344	
	LC9	47	31-59	335	
November 2016	LC6a	36	21-55	344	
	LC9	42	23-55	335	

2.5.3 The noise monitoring data are summarized in **Table 2.2**. Detailed monitoring data are presented in **Appendix E**.

Table 2.2 Summary of Noise Impact Monitoring Results

Reporting Month	Monitoring Station	Leq _(30min) Range, dB(A)		Leq _(30min) Limit Level, dB(A)
		Measured	Corrected	
September 2016	LC6a ¹	63-72	58-67	75
	LC9	65-70	N.A	
October 2016	LC6a ¹	68-73	63-68	
	LC9	68-71	N.A	
November 2016	LC6a ¹	65-74	60-69	
	LC9	68-71	N.A	

Note:

- Leq_(30min) was measured at day-time (0700-1900) on normal weekdays.
- 1) A distance correction of -5dB(A) has been applied in monitoring data of LC6a according to baseline monitoring report (Appendix G).

2.5.4 No Action or Limit Level Exceedance of 1-hr TSP monitoring was recorded in the reporting period.

2.5.5 No Action or Limit Level Exceedance of noise monitoring was recorded in the reporting period.

2.6 Other factor influencing the monitoring results

2.6.1 There were no other noticeable external factors generally affecting the monitoring results in this reporting period.

3. ADVICE ON THE SOLID AND LIQUID WASTE MANAGEMENT STATUS

3.1.1 The Contractor has been registered as a chemical waste producer for the Project. Construction and demolition (C&D) material sorting was carried out on site. Receptacles were available for general refuse collection.

3.1.2 Monthly summary of waste flow table is detailed in **Appendix H**.

4. ENVIRONMENTAL SITE INSPECTION AND AUDIT**4.1 Site Inspection**

- 4.1.1 Weekly site inspections and bi-weekly landscape and visual impact inspections were carried out to monitor the implementation of proper environmental pollution control and mitigation measures for the Project.
- 4.1.2 In the reporting period, site inspections were carried out on 2, 8, 13, 22 and 27 September 2016, 6, 12, 20 and 27 October 2016 and 3, 10, 17 and 24 November 2016 and the landscape and visual impact inspections were carried out on 2, 13 and 30 September 2016, 12 and 27 October 2016 and 10 and 24 November 2016.
- 4.1.3 The Contractor should isolate the offsite runoff to the site to prevent cross contamination, remove the storage materials and repair the protection fence to prevent any damage to the existing trees, Unused oil drums should place in the C&D wastes storage area and scattered rubbish should be cleared up regularly. Detailed of site inspections during the reporting period are summarized in the appendices of the corresponding Monthly EM&A Reports.

5. ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE**5.1 Environmental Exceedance**

- 5.1.1 No Action or Limit Level Exceedance of 1-hr TSP monitoring was recorded in the reporting period.
- 5.1.2 No Action or Limit Level Exceedance of noise monitoring was recorded in the reporting period.
- 5.1.3 The summary of noncompliance (exceedances) of the environmental quality performance limits (Action and Limit levels) are shown in **Table 5.1**:

Table 5.1 Summary of noncompliance (exceedances)

Parameter	No. of Exceedance		No. of Exceedance due to the Project		Cumulative Project-to-Date
	Action Level	Limit Level	Action Level	Limit Level	
1-hr TSP	0	0	0	0	0
Noise Leq _(30min) dB(A)	0	0	0	0	0

5.2 Complaints, Notification of Summons and Successful Prosecution

- 5.2.1 No complaints, notification of summons or successful prosecutions were received in the reporting period.
- 5.2.2 Cumulative complaint log, summaries of complaints, notification of summons and successful prosecutions are presented in **Appendix F**.

5.3 Incident of tree collapsed

- 5.3.1 A tree collapsed incident was reported by Contractor at around 15:45 on 29 September 2016. The tree No. LC-T09 which adjacent to the site boundary of Lok Chui Street Sewage Pumping Station was found collapsed on 29 September 2016 afternoon during the site inspection. A site inspection was arranged between Resident Site Staff (AECOM), Contractor as well as representative from EPD on 29 September 2016 and it was agreed that the collapsed tree could be felled in view of its poor and unhealthy condition together with the safety of the public. A tree felling report was submitted to EPD by CEDD on 15 November 2016.

6. IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

6.1 Implementation Status

- 6.1.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Reports, the EP and the EM&A Manuals. The implementation status of the mitigation measures during the reporting period is summarized in **Appendix G**.
- 6.1.2 Based on the monitoring results and the implementation status of the mitigation measures during the reporting period, it is considered that the environmental mitigation measures implemented by the Contractor in the reporting period are effective.

7. FUTURE KEY ISSUES

Potential environmental impacts due to the construction activities, including air quality, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The ET will continue to implement the environmental monitoring & audit programme in accordance with the EM&A Manual and Environmental Permit requirement. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

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8. CONCLUSIONS

- 8.1.1 The construction phase and EM&A programme of the Project commenced on 29 February 2016.
- 8.1.2 No Action or Limit Level Exceedance of 1-hr TSP monitoring was recorded in the reporting period.
- 8.1.3 No Action or Limit Level Exceedance of noise monitoring was recorded in the reporting period.
- 8.1.4 In the reporting period, site inspections were carried out on 2, 8, 13, 22 and 27 September 2016, 6, 12, 20 and 27 October 2016 and 3, 10, 17 and 24 November 2016 and the landscape and visual impact inspections were carried out on 2, 13 and 30 September 2016, 12 and 27 October 2016 and 10 and 24 November 2016.
- 8.1.5 No complaints, notification of summons or successful prosecutions were received in the reporting period.

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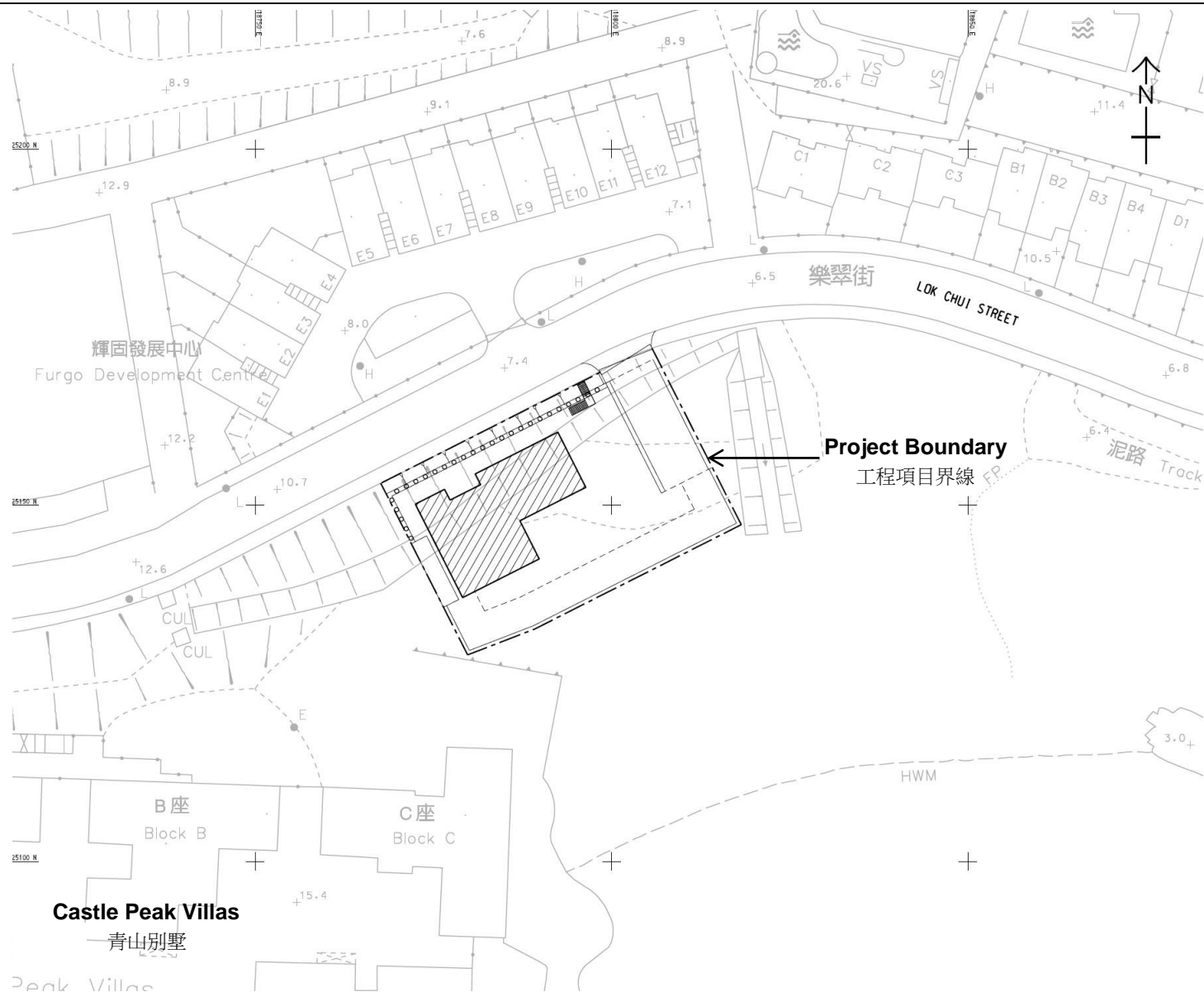
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Figure 1

Project General Layout



Location of the Proposed Sewage Pumping Station at Lok Chui Street near Castle Peak Villas
 位於樂翠街近青山別墅的擬建污水泵水站

Figure 1

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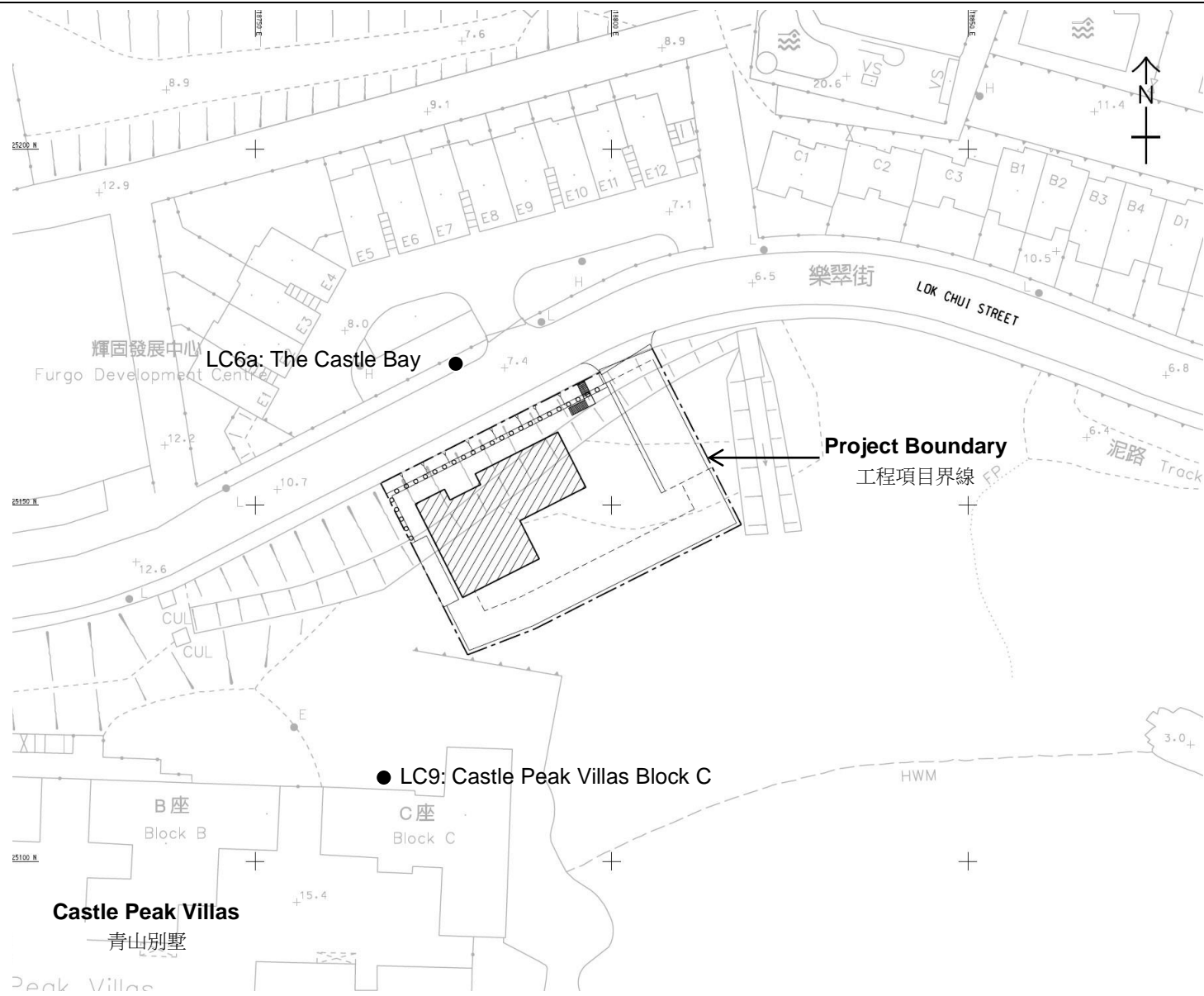
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Figure 2

Air and Noise Monitoring Locations



Air and Noise Monitoring Locations

Figure 2

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LC6a: The Castle Bay






LC9: Castle Peak Villas Block C



Note:

1) LC6a: The air and noise monitoring station is set at a point 1m from the exterior of the sensitive receiver fence wall, and set at a position 1.2m above ground. Façade measurement will be carried out for noise monitoring.

2) LC9: The air monitoring station is set at the top of parapet wall of sensitive receivers building and the noise monitoring station is set at a point 1m from the exterior of the sensitive receivers building façade and set at a position 5m above the ground.

Legend:  Proposed Air Monitoring Location
 Proposed Noise Monitoring Location
 1m from the exterior building façade

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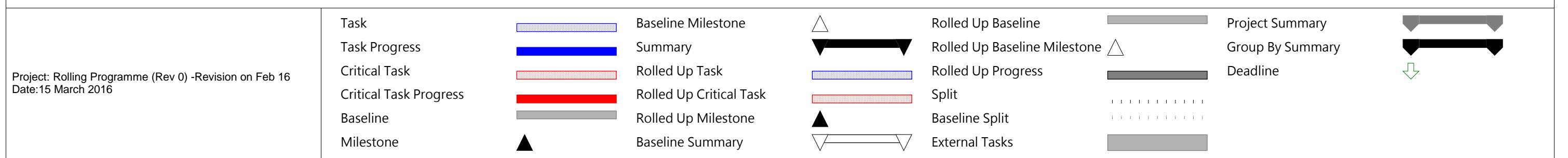
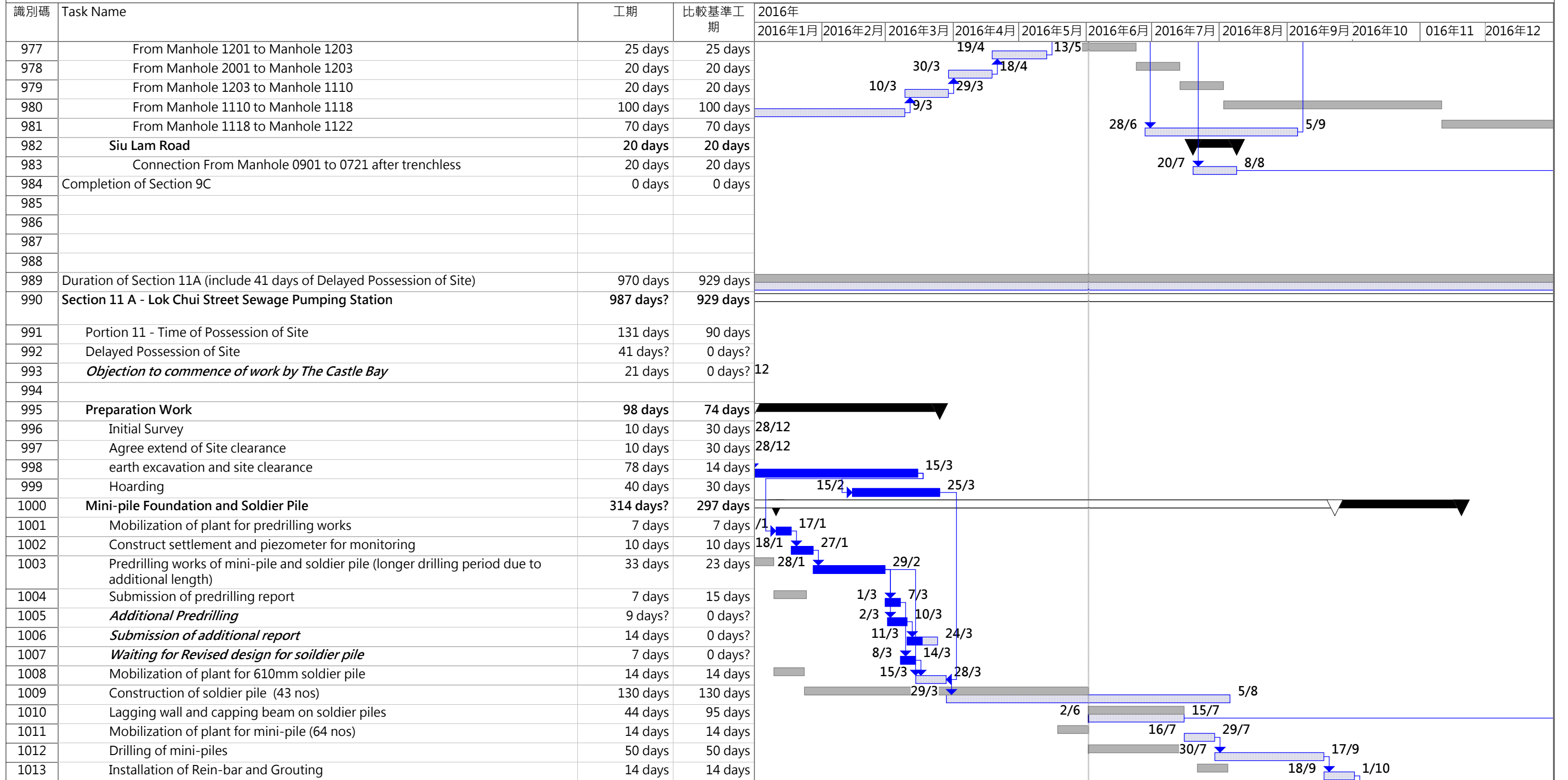
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Appendix A

Construction Programme



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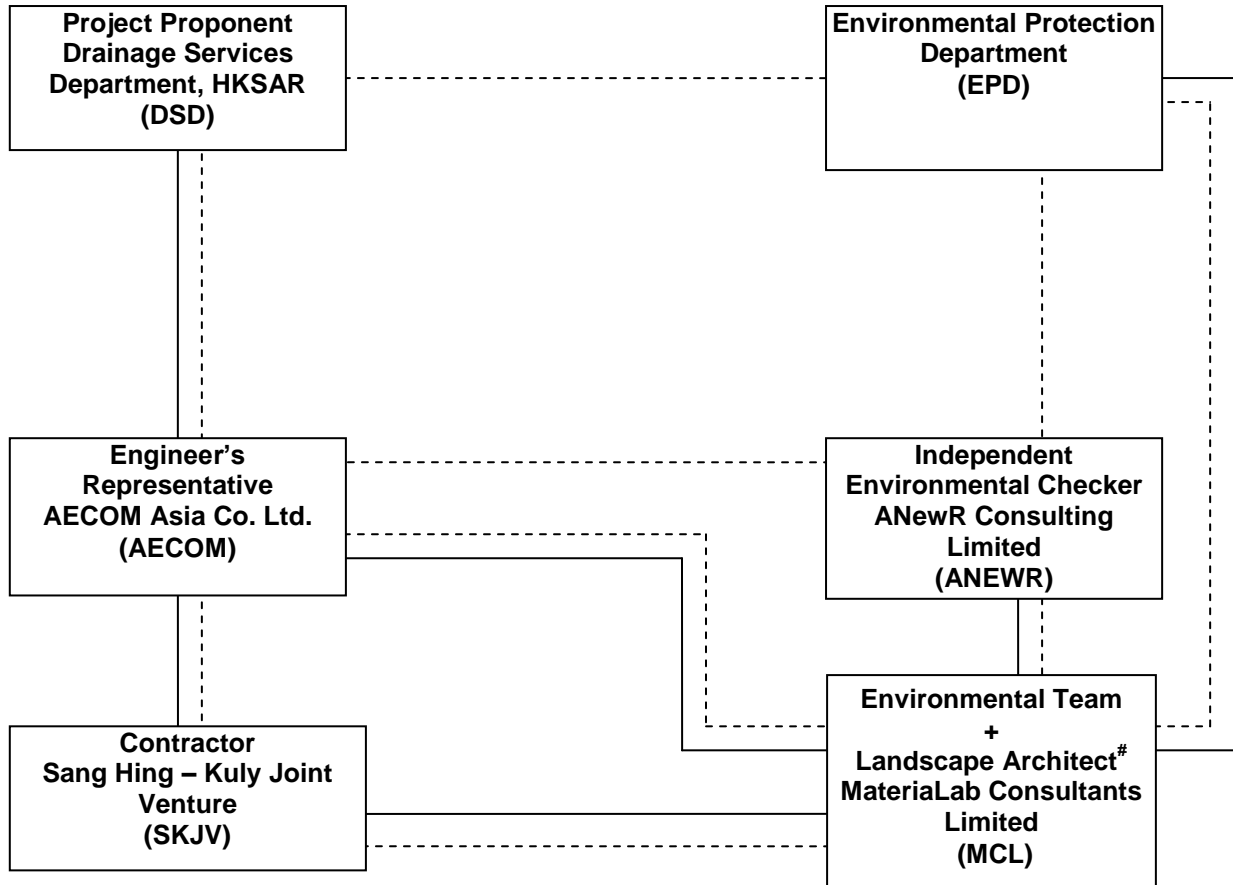
Appendix B

Project Organization Chart

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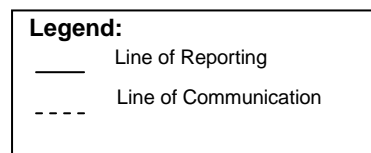
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Remark:

The Landscape Architect with a minimum of 1-2years on site experience as a member of the ET to monitor and audit the landscaping installation works and landscape protection measures.



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Appendix C

Action and Limit Levels for Air Quality and Noise

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Action and Limit Levels for Air Quality

Parameter	Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
1-hr TSP ($\mu\text{g}/\text{m}^3$)	LC6a	344	500
	LC9	335	

Action and Limit Levels for Construction Noise

Time Period	Location	Action	Limit
0700-1900 hrs on normal weekdays	LC6a LC9	When one documented complaint is received	75* dB(A)

* reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

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Appendix D

Air Quality Monitoring Data and Graphical Presentations

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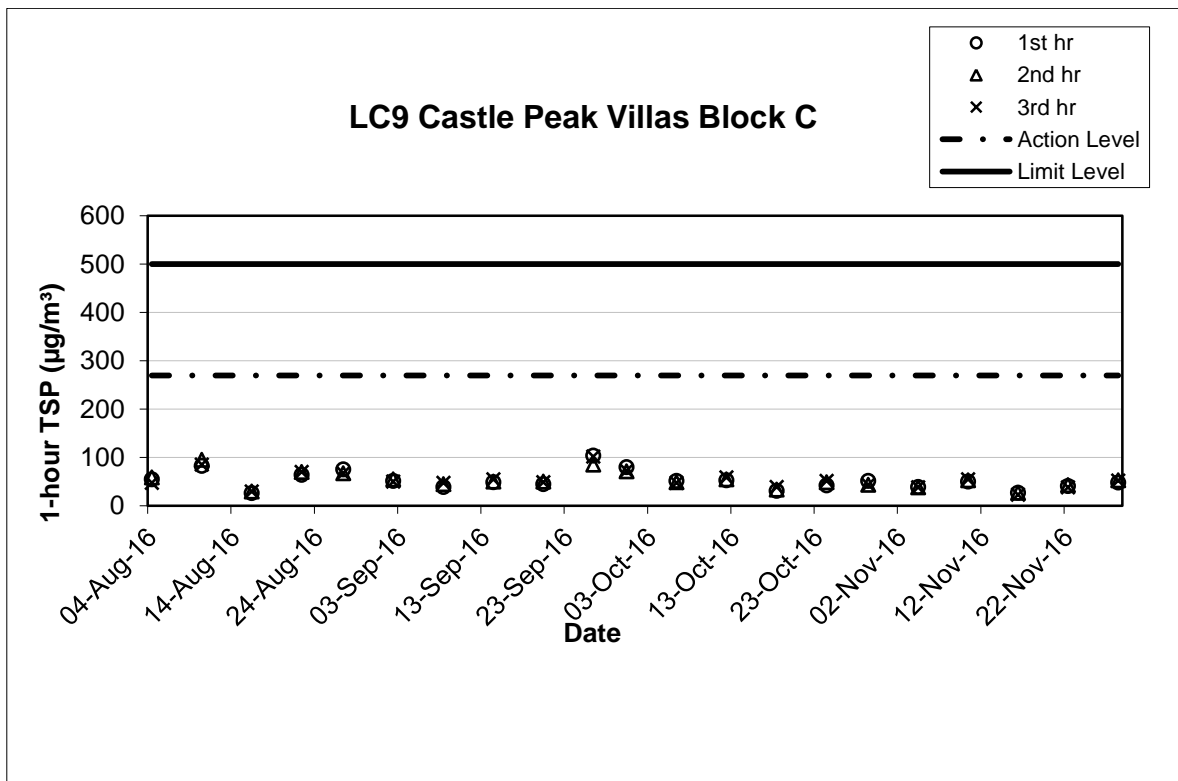
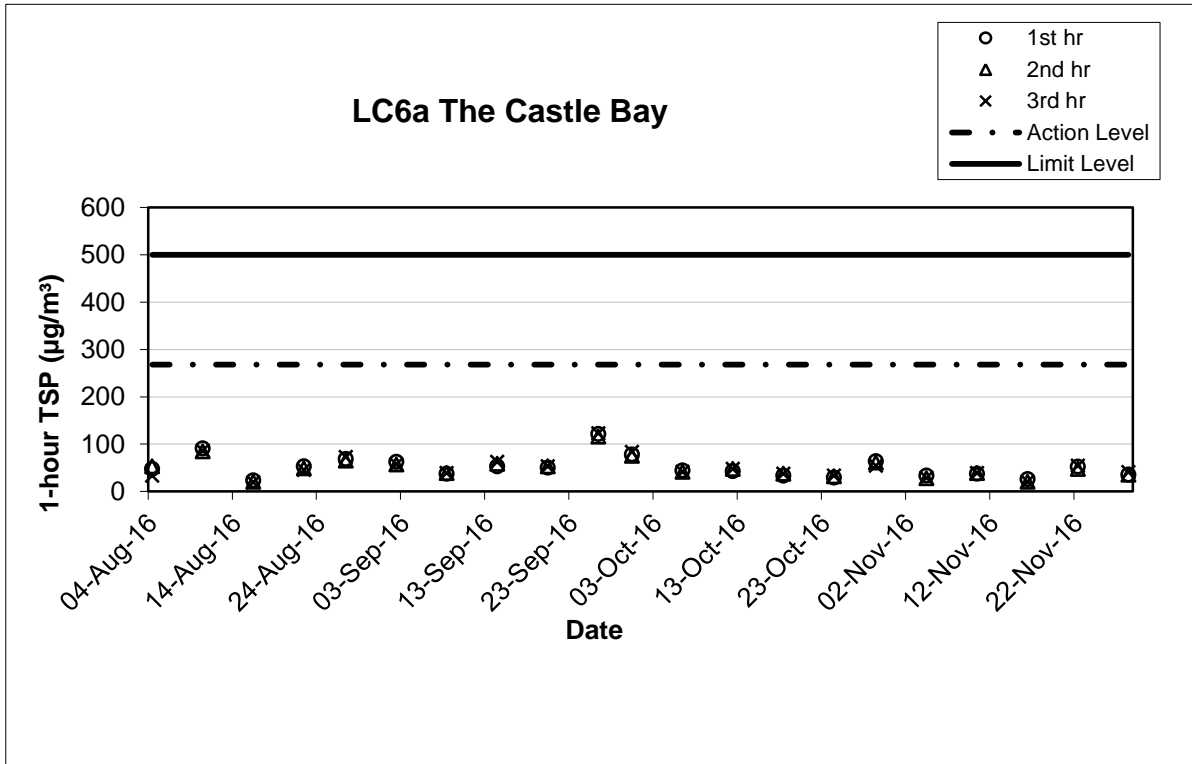
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LC6a The Castle Bay

1-hour TSP ($\mu\text{g}/\text{m}^3$)					
Date	Start Time	1st hr	2nd hr	3rd hr	Weather
04-Aug-16	15:30	48	53	34	Cloudy
10-Aug-16	08:47	91	85	87	Cloudy
16-Aug-16	13:50	24	21	20	Cloudy
22-Aug-16	12:48	53	49	46	Sunny
27-Aug-16	08:46	69	66	73	Fine
02-Sep-16	08:36	63	57	57	Cloudy
08-Sep-16	08:31	38	39	39	Sunny
14-Sep-16	13:05	53	59	63	Sunny
20-Sep-16	13:07	50	53	53	Sunny
26-Sep-16	14:35	122	116	123	Fine
30-Sep-16	15:05	78	76	84	Cloudy
06-Oct-16	14:04	45	42	42	Cloudy
12-Oct-16	13:03	43	48	48	Cloudy
18-Oct-16	09:05	34	38	38	Cloudy
24-Oct-16	14:12	29	32	34	Sunny
29-Oct-16	09:30	64	62	55	Cloudy
04-Nov-16	13:04	34	28	29	Fine
10-Nov-16	14:33	38	39	39	Cloudy
16-Nov-16	15:00	26	21	21	Fine
22-Nov-16	08:42	53	48	55	Cloudy
28-Nov-16	14:15	36	36	41	Sunny

LC9 Castle Peak Villas Block C

1-hour TSP ($\mu\text{g}/\text{m}^3$)					
Date	Start Time	1st hr	2nd hr	3rd hr	Weather
04-Aug-16	15:34	55	59	48	Cloudy
10-Aug-16	09:02	83	95	85	Cloudy
16-Aug-16	14:10	27	29	29	Cloudy
22-Aug-16	12:57	64	70	70	Sunny
27-Aug-16	09:03	76	67	67	Fine
02-Sep-16	08:51	52	55	50	Cloudy
08-Sep-16	08:40	39	45	48	Sunny
14-Sep-16	13:12	49	50	55	Sunny
20-Sep-16	13:15	45	50	49	Sunny
26-Sep-16	15:00	104	85	102	Fine
30-Sep-16	15:15	80	71	73	Cloudy
06-Oct-16	14:12	52	49	48	Cloudy
12-Oct-16	13:21	53	55	59	Cloudy
18-Oct-16	09:10	31	34	39	Cloudy
24-Oct-16	14:23	42	49	52	Sunny
29-Oct-16	10:15	52	43	43	Cloudy
04-Nov-16	13:15	39	38	38	Fine
10-Nov-16	14:40	50	53	55	Cloudy
16-Nov-16	15:14	27	27	23	Fine
22-Nov-16	09:00	41	43	38	Cloudy
28-Nov-16	14:22	48	53	52	Sunny



Note:

- 1) The major activities during the reporting period refer to section 1.4.1.
- 2) The weather conditions during the period refer to section 2.5.1.
- 3) The other factors influencing the monitoring results refer to section 2.6.

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Appendix E

Noise Monitoring Data and Graphical Presentations

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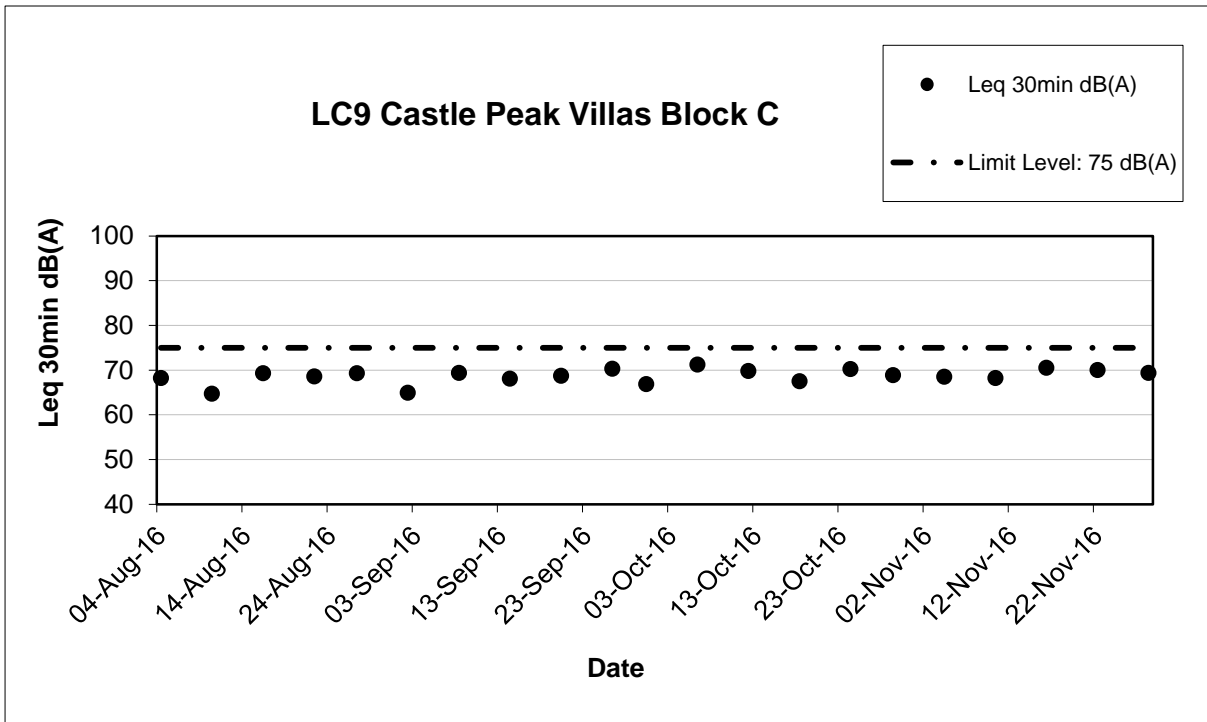
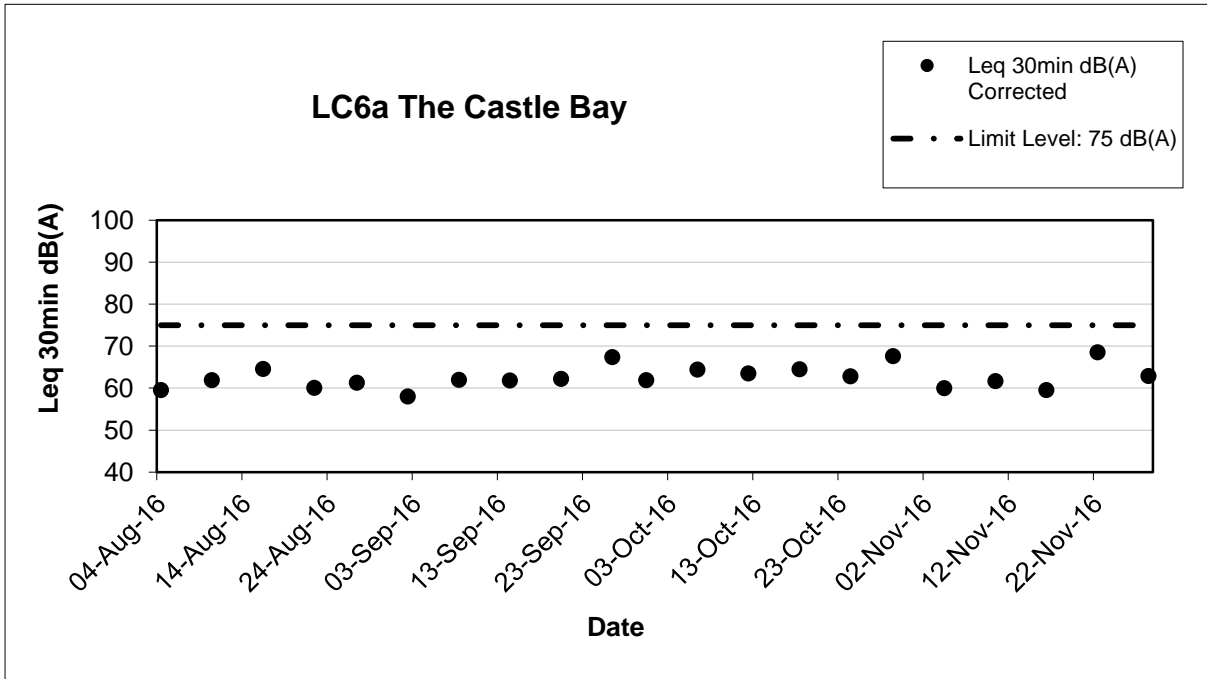
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LC6a The Castle Bay

Date	Start Time	L _{eq} 30min dB(A)	Corrected Leq 30min dB(A)	L ₉₀ dB(A)	L ₁₀ dB(A)	Weather
04-Aug-16	16:49	65	60	61	67	Cloudy
10-Aug-16	09:49	67	62	60	67	Cloudy
16-Aug-16	14:51	70	65	60	72	Cloudy
22-Aug-16	14:04	65	60	63	68	Sunny
27-Aug-16	09:54	66	61	57	69	Fine
02-Sep-16	09:42	63	58	59	64	Cloudy
08-Sep-16	09:45	67	62	60	71	Sunny
14-Sep-16	14:11	67	62	65	69	Sunny
20-Sep-16	14:06	67	62	65	70	Sunny
26-Sep-16	15:05	72	67	70	73	Fine
30-Sep-16	16:00	67	62	66	69	Cloudy
06-Oct-16	15:07	69	64	68	73	Cloudy
12-Oct-16	14:12	69	64	66	70	Cloudy
18-Oct-16	09:46	70	65	61	74	Cloudy
24-Oct-16	15:12	68	63	66	70	Sunny
29-Oct-16	09:24	73	68	70	74	Cloudy
04-Nov-16	14:04	65	60	63	68	Fine
10-Nov-16	15:22	67	62	65	70	Cloudy
16-Nov-16	16:24	65	60	62	68	Fine
22-Nov-16	08:45	74	69	71	75	Cloudy
28-Nov-16	15:11	68	63	66	71	Sunny

LC9 Castle Peak Villas Block C

Date	Start Time	L _{eq} 30min dB(A)	Corrected Leq 30min dB(A)	L ₉₀ dB(A)	L ₁₀ dB(A)	Weather
04-Aug-16	15:15	68	N.A	67	71	Cloudy
10-Aug-16	09:07	65	N.A	62	66	Cloudy
16-Aug-16	14:15	69	N.A	67	70	Cloudy
22-Aug-16	13:18	69	N.A	66	72	Sunny
27-Aug-16	09:05	69	N.A	61	72	Fine
02-Sep-16	08:55	65	N.A	64	66	Cloudy
08-Sep-16	08:58	69	N.A	65	72	Sunny
14-Sep-16	13:33	68	N.A	66	72	Sunny
20-Sep-16	13:22	69	N.A	65	72	Sunny
26-Sep-16	14:25	70	N.A	69	71	Fine
30-Sep-16	15:15	67	N.A	59	71	Cloudy
06-Oct-16	14:24	71	N.A	69	75	Cloudy
12-Oct-16	13:30	70	N.A	68	73	Cloudy
18-Oct-16	09:11	68	N.A	61	71	Cloudy
24-Oct-16	14:31	70	N.A	68	74	Sunny
29-Oct-16	10:11	69	N.A	64	72	Cloudy
04-Nov-16	13:22	69	N.A	66	70	Fine
10-Nov-16	14:45	68	N.A	65	71	Cloudy
16-Nov-16	15:16	71	N.A	64	76	Fine
22-Nov-16	09:25	70	N.A	67	72	Cloudy
28-Nov-16	14:30	69	N.A	66	72	Sunny



Note:

- 1) The major activities during the reporting period refer to section 1.4.1.
- 2) The weather conditions during the period refer to section 2.5.1.
- 3) The other factors influencing the monitoring results refer to section 2.6.

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Appendix F

Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions

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MaterialLab**Environmental Complaints Log**

Complaint Log No.	Date of Receipt	Received From and Received By	Nature of Complaint	Date Investigated	Outcome	Date of Reply
Nil	-	-	-	-	-	-

Cumulative Statistics on Complaints

Environmental Parameters	Cumulative No. Brought Forward	No. of Complaints This Month	Cumulative Project-to-Date
Air	0	0	0
Noise	0	0	0
Water	0	0	0
Waste	0	0	0
Total	0	0	0

Cumulative Statistics on Notifications of Summons and Successful Prosecutions

Environmental Parameters	Cumulative No. Brought Forward	No. of Prosecutions This Month	Cumulative Project-to-Date
Air	0	0	0
Noise	0	0	0
Water	0	0	0
Waste	0	0	0
Total	0	0	0

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Appendix G

Implementation Status of Environmental Mitigation Measures

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Air Quality

EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
4.5	Undertake all air pollution measures to prevent dust nuisance as a result of and during construction activities.	All unpaved haul roads, bulldozed material, exposed site areas / Throughout construction period	Contractor	TMEIA	*
4.5	No debris or other materials shall be burnt on the works areas.	All areas / Throughout construction period	Contractor	TMEIA. Avoid smoke impacts and disturbance	^
4.5	Dust suppression measures shall be provided and to be submitted to and approved by the Engineer.	All areas / Throughout construction period	Contractor	TMEIA	^
4.5	Stockpiles of imported material kept on site shall be contained within hoardings, dampened and/or covered during dry and windy weather.	All areas / Throughout construction period	Contractor	TMEIA Avoid dust generation	^
4.5	Material stockpiled along side trenches should be covered with tarpaulins whenever works are within village boundaries.	All areas / Throughout construction period	Contractor	TMEIA Avoid dust generation / visual impacts	^
4.5	Water sprays shall be used during the delivery and handling of cement, sands aggregates and the like.	All areas / Throughout construction period	Contractor	TMEIA Avoid dust generation	^
4.5	No batching of concrete should be carried out on site. Concrete should be used in ready mixed form and off loaded adjacent to designated works areas.	All areas / Throughout construction period	Contractor	TMEIA	^

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EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
4.5	Any vehicle used for moving cement, sands, aggregates and construction waste and the like shall have properly fitting side and tail boards. Materials shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards.	All areas / Throughout construction period	Contractor	TMEIA Avoid dust and spillage of material	^
4.5	No earth, mud, debris, dust and the like shall be deposited on public roads. Details of proposals for the wheel cleaning facilities shall be agreed with the Engineer. Such wheel washing facility shall be usable prior to any earthworks excavation activity on the Site.	All areas, particularly pumping station sites / Throughout construction period	Contractor	TMEIA Avoid spread/ deposition of mud	^
4.6.9	Pumping station vent shafts should be located away from sensitive receivers.	All pumping stations	DSD	TMEIA Avoid odour impacts	N/A
4.6.18	Use a covered container to store and transport the screenings from the pump house.	All pumping stations /operational phase	DSD	TMEIA Avoid odour impacts	N/A
4.6.18	Undertake the collection of the screenings and transfer to the covered container within the confines of the pump house.	All pumping stations / operational phase	DSD	TMEIA Avoid odour impacts	N/A
11.2.8	EM&A in the form of 1 hour total suspended particulates monitoring once per week	All sensitive representative receivers / Throughout construction period	Contractor	EM&A Manual	^

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MaterialLab**Noise**

EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
5.7.1 & 5.8.1	Ensure silencers are installed on the exhaust pipes of the trucks, excavators, compactors, concrete lorry mixer, and cranes for all activities.	All areas / Throughout construction period	Contractor	TMEIA	^
5.7.1 & 5.8.1	Use of mufflers on the breakers for all activities.	All areas / Throughout construction period	Contractor	TMEIA	^
5.7.1 & 5.8.1	Use of temporary noise barriers for all activities at the pumping station sites and during main sewer construction. During main sewer construction, barriers should be used to screen the activities of mobile equipment including the crane and excavator.	All pumping stations and main sewer construction locations / Throughout construction period	Contractor	TMEIA	^
5.5.10	Use of temporary noise barriers for all activities in the villages, where there is at least a 5m clearance	Village sewer alignment / Throughout construction period	Contractor	TMEIA	^
5.8.6 & 5.9.6	Manual breaking of concrete, where the concrete is less than 50mm thick.	Sewer alignment construction / concrete breaking activities	Contractor	TMEIA	N/A
5.8.6 & 5.9.6	Use of alternative pavement removal methods/equipment (kick ripper), where the concrete is less than 100mm thick	Sewer alignment construction / concrete breaking activities	Contractor	TMEIA	N/A

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EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
5.8.6 & 5.9.6	Use of acoustic enclosure in place of a barrier where there is a 6m clearance.	Sewer alignment construction / Throughout construction period	Contractor	TMEIA	^
5.8.6 & 5.9.6	Scheduling the numbers and operating times of equipment, when noise levels cannot be reduced to within the standards by other means	Sewer alignment construction / Throughout construction period	Contractor	TMEIA	^
5.8.11	The construction activities should be carried out in the daytime period (08.00- 18.00) only and shall exclude Sundays and public holidays.	All areas	Contractor	TMEIA	^
5.8.11	Powered mechanical equipment shall not be used within 5m of an NSR without the permission of the Engineer	All areas / Throughout construction period	Contractor	TMEIA	^
5.8.11	Carry out good site practice to limit noise emission at source.	All areas / Throughout construction period	Contractor	TMEIA	^
5.8.11	Avoid simultaneous noisy activities.	All areas / Throughout construction period	Contractor	TMEIA	^
11.2.8	EM&A in the form of noise monitoring.	All representative receivers / Throughout construction period	Contractor	EM&A Manual	^

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MaterialLab**Water Quality**

EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
6.4.3	Stockpiles of excavated material should be kept to a minimum and covered during times of heavy rainfall.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.4.10	Pass any trench dewatering through a portable sand/silt removal traps prior to discharge.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.2	When works are carried out during the rainy season exposed slopes, stockpiles should be covered with tarpaulin and temporary access roads protected with a layer of gravel or crushed stone.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.2	Surface run off should be discharged to storm drains via sand/silt removal traps.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.2	Channels, bunds or sand bags should be used to direct any storm water to the traps and perimeter channels should be constructed before the main works begin to prevent external run off from crossing the site.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.2	Silt removal structures, channels and manholes should be maintained to remove accumulated material, specifically at the onset and end of rainy periods.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^

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EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
6.5.2	Trenches for the sewer main should be dug and backfilled in short sections to minimise the quantities of rain water which will need to be pumped from them and upslope bunding provided to prevent surface water from flowing into the trenches.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.2	Rainwater pumped from the trenches should be discharged to storm drains via sand/silt removal traps.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.2	Discharges to natural water courses should only take place when the effluent can be shown to comply with the relevant specified standards.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94 & Technical Memorandum on Standards for Effluent Discharged in Drainage and Sewerage Systems, Inland and Coastal Waters	^
6.5.3	All plant should be in proper working order and maintained such that there is no leakage of fuel or oil. Any waste oils should be collected in designated tanks prior to disposal off site.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	*

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EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
6.5.3	All mechanical plant maintenance and refuelling areas shall be sited on paved areas. All storm water run-off from these areas should be discharged via oil separators/petrol separators and sand/silt removal traps.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.4	Groundwater pumped out of excavations for the construction of pump sumps should only be discharged following removal of silt by sand/silt removal traps.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.5	Water from drilling of rock should be discharged following removal of silt by sand/silt removal traps.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.6	The wheels of all vehicles leaving the construction site should be washed before leaving the site to minimise the carry over of mud onto public roads. Wheel wash water should be recycled and only discharged following removal of silt by sand/silt removal traps.	All areas particularly pumping station sites / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.7	Run off from the roofs of site buildings should be conveyed in closed drains to the nearest surface water course to prevent the generation of excessive quantities of surface water run off carrying suspended solids.	Site Office areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.5.7	All spillages should be cleaned up immediately to prevent their downward migration into the groundwater.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^

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EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
6.5.7	Sewage from toilets and any kitchens in the site facilities should be treated via a septic tank system or if this is not practicable chemical toilets should be provided and the waste from these together with 'grey water' removed from the site on a daily basis for disposal at an appropriate receiving point.	All areas / throughout construction period	Contractor	WPCO, TMEIA & ProPECC PN 1/94	^
6.6.2	Overflow bypasses to be used in emergency situations only and no effluent should be discharged during regular maintenance.	All pumping stations / Operation	DSD	WPCO, TMEIA	N/A
6.6.3 & 6.6.4	Supply pumping stations with stand-by pumps, emergency power supplies and telemetry system.	All Pumping Stations	DSD	WPCO, TMEIA & ProPECC PN 1/94	N/A
11.2.8	EM&A in the form of site supervision to ensure water quality protection measures are implemented.	All areas/ Throughout construction period	Contractor	EM&A	^

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Waste Management

EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
7.12.1	The Contractor shall identify a coordinator for the management of waste. The coordinator shall prepare a Waste Management Plan which specifies procedures such as a ticketing system, to facilitate tracking of loads and to ensure that illegal disposal of wastes does not occur, and protocols for the maintenance of records of the quantities of wastes generated, recycled and disposed. The Waste Management Plan shall be prepared with reference to Works Branch Technical Circular (WBTC) No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material and issued to the DEP and CED to confirm the availability for C&D and public fill waste.	Plan to be prepared prior to the start of construction, Implementation throughout construction period / All areas	Contractor	TMEIA.Works Branch Technical Circular (WBTC) No. 5/99 for the Trip-ticket System for Disposal of Construction and Demolition Material	^
7.12.1	Stockpiled material should avoid vegetated areas where possible and covered by tarpaulins. Storage of material on site should be kept to a minimum.	All areas/ Throughout construction period	Contractor	TMEIA. Prevent windblown dust and/or surface run-off / avoid nuisance to local residents	^
7.12.1	Surplus material should be sorted on site into C&D waste and that suitable for public fill	All areas /throughout construction period	Contractor	TMEIA. Maximise reusable material	*
7.12.1	The contractor should provide a temporary storage area for general refuse during the construction phase which should be enclosed to avoid refuse being windblown and affected by rain. General refuse should be stored on site for a minimum period and disposed of at a licenced facility.	All areas / throughout construction period	Contractor	TMEIA	*

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EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
7.12.1	Excavated material in trucks shall be covered by tarpaulins to reduce the potential for spillage.	All areas / throughout construction period	Contractor	TMEIA	^
7.12.1	Suitable chemical waste storage areas shall be formed on the site for temporary storage pending collection. All chemical wastes shall be handled, stored, transported and disposed of in accordance with the relevant practices.	All areas / throughout construction period	Contractor	TMEIA/ Code of Practice on the Package, Labelling and Storage of Chemical Wastes and A Guide to the Chemical Waste Control Scheme	*
7.12.1	Nightsoil arising from chemical toilets and on site chemical treatment facilities shall be transported by a licensed contractor to government Sewage Treatment Works for disposal.	All areas / throughout construction period	Contractor	TMEIA/ Sanitation and Conservancy (Regional Council) By-laws	^
7.12.1	Any screenings and grit that are removed during maintenance shall be disposed of at a landfill site. The material shall be suitably contained and covered.	All areas / operational phase	DSD	TMEIA	N/A
11.2.8	EM&A in the form of supervision of waste management practices	All areas / throughout construction period	Contractor	EM&A	^

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Landscape and Visual

EIA Reference	Environmental Protection Measures	Location/ Timing	Implementation Agent	Relevant Standard or Requirement	Implementation Status in Construction Phase
10.8.5, 10.9.15, 10.10.6, 10.10.11, 10.10.20, 10.11.6	Use of a suitable colour scheme to the pump station building to match the design of the adjacent properties.	All pumping stations	DSD & Contractor	Reduce visual intrusion of pumping stations	N/A
10.8.5, 10.9.15, 10.10.11, 10.10.20, 10.11.6	Construction of boundary wall similar to the adjacent housing instead of standard chain link and barbed wire fence.	All pumping stations except Tai Lam Correctional Institution	DSD & Contractor	Screen pumping stations	N/A
10.8.5, 10.9.15, 10.10.11, 10.10.20, 10.11.6	Planting of trees and shrubs to the boundary of the pumping station compound.	All pumping stations except Tai Lam Correctional Institution	DSD & Contractor	Screen pumping stations	N/A
10.8.6	Minimise damage to the rootball of the tree east of the pumping station site.	East of Castle Peak Villas pumping station/ During excavation	DSD and Contractor		^
11.2.8	EM&A in the form of site supervision of protection measures for trees and landscaping and compensatory planting establishment during the construction and operational phases respectively	All areas	Contractor	EM&A	^

Remarks: ^ Compliance of mitigation measure
* Recommendation was made during site audit but improved/ rectified by the Contractor
N/A Not Applicable at this stage as no such site activities were conducted in the reporting month

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Appendix H

Monthly Summary of Waste Flow Table

Sang Hing – Kuly Joint Venture
Environmental Monthly Report for Contract No. DC/2014/01
Castle Peak Road Trunk Sewer and Tuen Mun Village Sewage

Name of Department: DSD

Contract No.: DC/2014/01

Monthly Summary Waste Flow Table for 11/16 (MM/YY)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
Jan 2016	-	-	-	-	-	-	-	-	-	-	-
Feb 2016	-	-	-	-	-	-	-	-	-	-	-
Mar 2016	0.100	-	0.100	-	-	-	-	-	-	-	0.001
Apr 2016	0.005	-	-	-	-	0.005	-	-	-	-	0.001
May 2016	0.000	-	-	-	-	-	0.001	-	-	-	0.001
Jun 2016	0.600	0.600	0.600	-	-	-	0.001	0.0024	-	-	0.001
Jul 2016	-	-	-	-	-	-	-	-	-	-	0.001
Aug 2016	-	-	-	-	-	-	-	-	-	-	0.001
Sept 2016	-	-	-	-	-	-	-	0.0024	-	-	0.001
Oct 2016	-	-	-	-	-	-	-	-	-	-	0.001
Nov 2016	-	-	-	-	-	-	-	-	-	-	-
Dec 2016	-	-	-	-	-	-	-	-	-	-	-
Total	0.705	0.600	0.700	-	-	0.005	0.002	0.0048	-	-	0.008

Sang Hing – Kuly Joint Venture
Environmental Monthly Report for Contract No. DC/2014/01
Castle Peak Road Trunk Sewer and Tuen Mun Village Sewage

Forecast of Total Quantities of C&D Materials to be Generated from the Contract*										
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000m ³)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
27	10	8	1	1	0	2	1	1	1	2

Notes:

- (1) The performance targets are given in ETWB Technical Circular PS Clause 6(14).
- (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
- (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material
- (4) *The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m³. (ETWB Technical Circular PS Clause 5(4)(b) refers).
 [Delete Note (4) and the table above on the forecast, where inapplicable].